AMERICAN JOURNAL
OF
PHOTOGRAPHY

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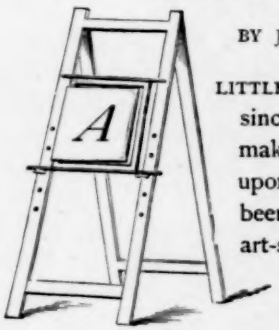
VOL. XIII. JUNE, 1892. No. 150.

EARLY DAGUERREOTYPE DAYS.

AN HISTORICAL REMINISCENCE.



BY JULIUS F. SACHSE.

LITTLE more than half a century has elapsed since the introduction of the process for making pictures by the action of light upon a sensitive plate. Yet so great have been the strides of advancement in this art-science of photography within that comparatively short period, that the early processes and the events which marked the introduction of the daguerreotype in the United States have already been lost sight of by all but the few yet remaining who were once interested in the practice or perfection of the discovery.

It is the early daguerreotype days to which the writer wishes to draw attention,—the period extending from the memorable September day in 1839 when the first account of Daguerre's discovery reached America, until the year 1853, which marked the zenith of the daguerreotype process in the United States.

To many a reader at the present day these reminiscences will at first, perhaps, appear somewhat dry and uninteresting, with an apparent excess of documentary detail, which must necessarily be

introduced to substantiate some of the broad claims made to establish the fact that Philadelphia is really the mother city of photography in America. Nor should the fact be overlooked that it was by means of the individual efforts of Philadelphia's investigators and scientists that the defective process of 1839 was perfected and widened out to one of the greatest industries of the day, which now, next to the newspaper, is more widely disseminated throughout the civilized world than any other branch of art, and that the profit and pleasure which is now derived from photography in its widest sense is all, more or less, due to the crude experiments and patient investigations of these almost forgotten pioneers.

Another leading object of this paper is to gather the scattered facts and data from the musty archives of the old scientific institutions which were active in fostering the development of the heliographic art while it was yet in its infancy, and the whole matter was received with doubt and suspicion by the public at large. These fragments, collected under one head and properly classified, together with the recollections of some of the leading daguerreotypists yet living, and other material in possession of the writer, will form a complete historical record of the introduction, development, progress and decline of the first era of heliography, far more exhaustive than any ever before presented to the photographic public; showing the prominent part taken by Philadelphia's scientists and investigators in the development of Daguerre's process in its early stages, and proving the fallacy of the conclusions arrived at in France that the original process as published was but little susceptible of improvement,—in fact, that there appeared to be scarcely any room for alteration, at least to advantage. It is further an interesting fact that Daguerre at first considered it impossible to apply the daguerreotype to the production of portraits,* for with the iodine alone, and the long-focused camera obscura which was first employed, no picture could be taken, even under favorable circumstances, in less than about a quarter of an hour; and as the correctness of a portrait produced by this art depends upon perfect immobility during the whole of the sitting, *the mere idea of such* an

* Claudet, Trans. Soc. Arts, etc., Jour. F. I. Vol. X., 3d Series, p. 50.

application of photography is looked upon as altogether absurd :— thus wrote M. Claudet long after the promulgation of the original process.

Without wishing to detract one iota from the claims which may be justly due to Professors John William Draper and Samuel Morse, of New York, and other investigators in different localities, yet it is nevertheless an incontrovertible fact that, with the labors of Philadelphia investigators, fostered by Philadelphia's scientific institutions, the crude heliographic process of Daguerre was brought to a state of perfection for practical purposes, and thus received the impetus which established the art throughout this country and Europe.

A perusal of this paper, with the quoted authorities, will show

1. That Joseph Saxton, of Philadelphia, made the first heliograph in America, October 16th, 1839.

2. That Robert Cornelius, of Philadelphia, obtained the first picture of a human face by Daguerre's process in the world, November, 1839.

3. That to Dr. Paul Beck Goddard, of Philadelphia, belongs the honor of the discovery of bromine as an accelerator, December, 1839.

4. That Dr. Paul Beck Goddard, of Philadelphia, was the first in the world to obtain an instantaneous picture by heliography, December, 1839.

5. That William G. Mason, of Philadelphia, obtained the first perfect picture in the camera, by aid of artificial light, December, 1839.

6. That the first portrait studio in America, if not in the world, was opened in Philadelphia, February, 1840, at the northeast corner of Eighth Street and Lodge Alley, by Robert Cornelius.

7. That Joseph Saxton, of Philadelphia, in 1841, produced the first photo-mechanical reproduction for use with printers' ink, which combined in its production the daguerrotype, electrotype, and a mechanical process.

The Dawn of Heliography in America.

The first authentic account of Daguerre's process to reach America was a letter written in Paris and sent to Alexander Dallas Bache, a member of the American Philosophical Society of Philadelphia, then the leading scientific organization in America. This letter, which embodied the whole secret then first made public,* was published in the *United States Gazette* Wednesday, September 25th, 1839, with an introduction in which it was stated that some steps of the process are not explicable by known laws.

The Daguerreotype Explained.

The Academies of Sciences and of Fine Arts of the Institute met on the 19th of August last to hear the explanation of the process of M. Daguerre from the perpetual secretary, M. Arago.

It appears that in the earlier attempts to form a permanent picture of external objects by the aid of the camera obscura, chloride of silver was used as in the method of photogenic drawing of Mr. Talbot. In this case the light blackens the paper, the depth of the shade being proportional to the intensity of the light; the lights are thus represented by dark parts of the picture and vice versa. M. Niepce first ascertained that an effect the reverse of that just mentioned might be produced by using a particular kind of

* Vide Am. Jour. of Photo., 1890, Vol. XI., p. 199.

The American Philosophical Society was formed in the year 1769, by the union of two literary societies that had previously subsisted in Philadelphia. One of these, styled the "American Philosophical Society," was instituted in 1743, and at the time of the union consisted of one hundred and twenty-seven members. The other, styled the "American Society for Promoting Useful Knowledge," was instituted in 1766, and at the union consisted of seventy-eight fellows and sixty-nine corresponding members.

The Society was incorporated by an act of the Legislature of Pennsylvania, in 1780.

Aided by the liberal donations of a number of friends of science, both in America and Europe, and by the Legislature of Pennsylvania, the Society was able to erect shortly after the close of the Revolutionary War, their present building upon Independence Square, Fifth below Chestnut Streets. From that time on the Society entered upon an era of prosperity and usefulness until at the time of writing it was the foremost scientific society in America, numbering among its members many of the most noted scientists

bitumen, dissolved in oil of lavender, and that this picture might be preserved. The picture formed upon the bitumen required, to render it fully visible, the use of petroleum, which acted upon the parts of the picture not affected by the light. This process was a very imperfect one, requiring a long time for its execution, and yielding but imperfect results. The invention had been brought to this stage when M. Daguerre undertook to improve it. By many curious experiments and much labor he was gradually led to his present process, the details of which present some very strange, and so far unexplained, phenomena.

A sheet of copper, plated with silver, is carefully cleaned on the silvered side by the aid of nitric acid. The cleansing requires great care and especial precaution, the plate requiring to be rubbed backwards and forwards in a fixed direction. Plated copper is found better than silver.

The plate thus prepared is exposed to the action of the vapor of iodine. For this purpose it is placed in a box upon the bottom of which a small quantity of iodine is strewed, separated from the plate by a gauze screen, so as to diffuse the vapor uniformly. The plate must be closed in a metallic frame, to prevent the vapor from acting more upon the edges than near the centre, the success of the whole operation depending essentially upon the uniformity of the coating of iodide of silver, which is formed upon the surface.

A yellow tint indicates that the plate has been sufficiently long exposed to the action of the vapor. It is then transferred to the camera obscura, carefully excluding it meanwhile from the light. M. Daguerre is understood to have made some improvements in this instrument; to understand the process of the present operation, however, it is only necessary to observe that a plate of ground glass having been previously placed so as to receive a distinct image of the object to be delineated, the prepared silver plate is substituted for it. The effect is immediate, but is only very slightly perceptible.

philosophers, students, and theologians in Europe as well as America.

The library of the Society is large and valuable, as is also the museum and the collection of manuscripts. The hall of the Society, built in 1785, has lately been enlarged, and made strictly fire-proof. The picturesque "bit" shows a nook in the old hall prior to the late alterations.

The plate is next exposed to the action of the vapor of mercury, and a condition stated to be essential is, that it shall be placed under a particular angle. It is, therefore, placed in a second box, at the bottom of which is a small trough of mercury, heated to between 160° and 170° Fahrenheit, and if the picture is to be viewed when hanging vertically the inclination of the plate to the surface of the mercury must be 45°. The vapor of mercury appears to affect only the parts which have been already acted upon by the light, forming probably an amalgam of mercury and silver. After this operation the plate is dipped into a weak solution of hyposulphite of soda, and then washed with distilled water. The process is now complete, and the plate presents a drawing in which the light and shade is truly represented, and which may be exposed without change to the action of light.

This account was republished in the proceedings of the Franklin Institute* for September, 1839, without notice or comment, but was followed in the next number (October, 1839, p. 287) with an account from *Galignani* of three street scenes in Paris taken from Daguerre's atelier, which were exhibited before the Chamber of Deputies at a meeting subsequent to the one held August 19th. This notice further stated that

The chemical substance upon which the light acts, according to M. Daguerre's method, is laid upon sheets of copper which, for the drawing exhibited on Saturday, were about 9 or 10 inches by 6 or 7 inches. The cost of such plates M. Daguerre estimates at about three francs or fifty cents each, but he expects that considerable reductions may be ultimately made in their cost, and that the improvement of his method will render it applicable to other substances not metallic.

A Nook in the Li rary.

Notwithstanding these repeated notices of the heliographic process, no action whatever was taken upon the subject by the scientific institutions, as the published accounts were thus far looked upon as unworthy of serious consideration.

* The Franklin Institute was founded in the year 1824, the purpose of its originators being to found an institution for the promotion of the mechanic arts, at that time in their infancy in this country. From the period of its establishment to the present, it has actively and honorably fulfilled its mission,

A few weeks later, however, a more detailed account of Daguerre's process reached America; this was from an eye-witness, a special correspondent of the *New York Star*, who was then in Paris, which was published in that paper October 14th, 1839. This letter gave an account of the public demonstration given by Daguerre on the 17th of September at the Grand Hotel on the Quay d' Orsay.

So skeptical were the Parisians of Daguerre's claims, and so great was the popular opposition to the grant made by the Deputies to the inventor, that to silence public clamor the Minister of the Interior ordered Daguerre to give three public demonstrations of his process, so that the interested public might judge whether the Chamber of Deputies were justified in giving the pension to Daguerre for the disclosure of his discovery. Admission to these exhibition was by tickets to be obtained free of cost. Yet so great was the interest taken that the supply of tickets was soon exhausted, after which many were sold by those who had been fortunate enough to obtain them in the first instance, the prices realized ranging all the way from ten to one hundred francs. It was the first of this series of lectures which the New York *Star* correspondent attended and described in detail.

Three days after the publication in New York the article was printed in the *American Daily Advertiser* for Wednesday, October 16th, 1839, published in Philadelphia by Zachariah Poulson at 106 Chestnut Street,—viz.:

He [Daguerre] took a plate of copper plated with silver, and rubbed the silver surface in a slight manner with very fine pumice powder and

and has been closely identified with so many measures for the encouragement and growth of the arts and manufactures, that no history of American industries would be complete which omitted to record its service.

Associated with its past history are the well known names of Merrick, Ronaldson, Keating, Baldwin, Bache, Agnew, Espy, Harrison, Johnson, Mitchell, Patterson, Frazer, Cresson, Rogers, and many others of equal prominence: while its roll of membership to-day embraces the names of all who are identified with the learning and industries that have given Philadelphia her leading position among American cities.

The hall of the Institute is a large and substantial structure of blue stone, situated on the east side of Seventh Street, midway between Market and Chestnut Streets. The corner-stone of the building was laid in the year 1825, and it has been occupied by the Institute to the present time. The extensive and very complete library of the Franklin Institute is one of the most valuable libraries of reference upon scientific and mechanical subjects in the United States. For this purpose it is accessible to the public, and visitors from all parts of the country constantly consult its shelves.

sweet oil, using small balls of cotton wool for this purpose. He thus completely dulled the surface, and I noticed that he rubbed first with a circular motion and then with straight lines from top to bottom.

He then washed the plate thus dulled in a liquid consisting of

Distilled water	16 parts.
Nitric acid	1 part.

He then gave a slight heat to the plate by passing it over the flame of a lamp,—the copper side being next to the flame and the silver surface uppermost. He then washed it a second time in the dilute nitric acid.

The plate was now ready for a coating of iodine. The apartment was darkened, and the plate, fixed on a small board, was placed (with the silver part downwards) over an opening the size of the intended picture, in the lid of a box at the bottom of which the iodine was. Half way down in the box was a slight wooden frame on which a piece of muslin was strained, and through this muslin, as the iodine evaporated, the fumes rose, and were thus equally received upon the silvered surface, thus forming a coating of iodine of silver, having the yellow appearance of brass.

A camera obscura was now brought up. Its focus had previously been adjusted by trying the effect of the picture on a bit of ground glass. The plate prepared as above was placed in the camera. The view intended to be taken was the Tuileries, the Quay and the Seine in front of the window where the camera obscura was placed. It was there to remain until the action of the sun's rays on its surface was sufficient. This occupies a period of from five to forty minutes, according to the time of year and state of the weather, and as the director (for I cannot call him the operator) cannot see by the plate how

The upper floor is entirely devoted to the use of the large drawing classes composed of young men and women pursuing studies in mechanical, architectural and free-hand drawing.

The rapid growth, of late years, of the library and schools of the Institute, has taxed the ingenuity of its officers to the utmost to carry on its work effectively, the accumulation of books, models, instruments, etc., having become so great as to make it almost imperative to secure more ample quarters. In the collections of the Institute are some interesting historical relics, among which may be named the original electrical machine of Dr. Franklin, Godfrey's original quadrant, an original telegraphic apparatus of Morse, models of Oliver Evans's high pressure engine, and others of less importance.

The Franklin Institute signalized the earnestness of purpose of its founders in promoting the mechanic arts, by holding in the year of its foundation the *first exhibition of American manufactures* held in the United States. This historical event occurred in the

the process goes on, experience alone can tell him how to judge as to the advancement which the action of light has made. In this instance the day was dull, and the plate remained fifteen minutes in the camera obscura. When it was taken out it appeared exactly the same as when it was put in, and the people looked very blank, I do assure you, at what looked like a failure; but indeed one could scarcely tell whether or not it had been marked, for the process requires that no light should fall on it before the finishing operation.

M. Daguerre took the plate and held it with the silver part downwards, and thus held it for half a minute, while three persons peeped upon it and said, "Nothing has been traced upon it."

He fixed it then, at an angle of 45°, in a box at the bottom of which was an earthen pan holding two pounds of mercury. Under the pan was a lamp which heated the mercury to 62° Centigrade or 117° Fahrenheit, and as the mercury grew hot its globules arising [that is, its fumes arising] combined with the prepared surface of the metal, *brought out the picture.* In front of the box is a glass spy hole, through which the process was watched, and the moment it was completed the plate was taken out and washed with distilled water saturated with common salt or with hyposulphite of soda, heated a degree below the boiling point. This finished it, and the picture, thus literally executed by the sun, was handed about.

I never, continues the correspondent, saw anything more perfect. When examined by the naked eye every object appeared minutely engraved, but when viewed through a magnifying glass the difference of grain in the separate flags on the *trottoir* was visible, and the texture of everything, if I may use the phrase, was easily distinguishable.

The time occupied by the whole process was 72 minutes, which is much more than I had been led to expect.

(*To be continued.*)

year 1824, in the old Carpenters' Hall, in Philadelphia, and was crowned with complete success. To use the words of a historian of this event, "it attracted large crowds of people, who hitherto had had no conception of the extent and variety of our home productions, and served in many curious and unexpected ways to bring producers and consumers together, and to diffuse a knowledge of our domestic skill and resources."

The Institute commenced in the year 1826 the publication of a journal devoted to science and the mechanical arts, which has had an uninterrupted existence to the present day. It contains the records of the scientific work of the Institute, besides many valuable contributions respecting the growth of American industries, and the progress of science and the useful arts during the past half century. It is highly esteemed at home and abroad as a standard work of reference. It is to this journal that frequent references are made during the course of this paper.

THE WET COLLODION PROCESS.—III.

BY ELLERSLIE WALLACE.

THE silver bath into which the collodionized plates are dipped in order to convert the salts in the collodion into the sensitive material required, is merely a solution of pure nitrate of silver in pure water. The average strength is forty-five grains of the nitrate to each ounce of distilled water. It is the custom, however, to add a minute amount of pure nitric acid in order to make the plates work cleaner. A good rule for this latter addition is to begin with *one drop* of the C. P. nitric acid *for every ounce* of nitrate of silver crystals. If this small quantity, which barely reddens blue litmus paper, is not enough, more may be cautiously added until the blue paper turns rather quickly.

The water of which the bath is made should either be distilled, or good spring or river water might be used. No foreign matters, such as oil and iron rust in the condensed water from steam-engines, or lime salts in "hard" water, should be present. The silver bath is kept in a covered glass trough, sold by dealers for the purpose, and should not be exposed to white light. The trough, as well as the "dipper" used for lowering the plates into the solution, is well washed and cleaned before pouring in the silver solution.

The operations of coating the plates with collodion and dipping them into the bath are perfectly simple and easy when once understood, but it is almost impossible to give lucid directions for them in writing. Those who know nothing of these operations should see them done by some good photographer before attempting them for themselves. I will now try to give an idea how to do them.

The bath is supposed to be standing ready on the table in the dark-room, the dipper being in the trough in readiness to take the plate. The collodion being in a four- or eight-ounce glass-capped "pourer" is supposed to have the right age, and to be perfectly bright, clear and free from sediment. The albumenized glass is in

• Continued from page 197, Vol. XIII.

a box on the table conveniently near to the collodion and the bath. The operator has the door of the dark-room under convenient control, so as to darken the room the moment the plate is dipped into the silver bath. It is always best to leave the door open until after the plate is coated. Plenty of light is required for this operation, and there is a better opportunity for the escape of the fumes of the collodion.

Standing in the doorway with his face towards the light, the operator folds up a piece of clean blotting-paper about two inches square, and carefully lifting out a clean glass from the box, he holds the glass with its albumenized side uppermost with his left hand by one corner only. The square of the paper is applied under this corner, so that the four fingers of the left hand support the plate *without touching it.* The thumb just touches the extreme of the corner at the top.

Having seen that the surface of the glass is free from dust, or having *very lightly* passed over it with a wide camel's-hair blender, the collodion is poured steadily on, circled over the plate and the excess returned to the bottle; the plate being meantime rocked to and fro until the collodion ceases to drip off and becomes congealed. When the lower corner of the plate will receive the impression of the tip of the finger without sticking to it, the dark-room door is promptly closed and the plate set on the dipper, which is raised from the bath for a moment. They are then firmly lowered into the solution. Any stoppage in the act of dipping the plate will make an ineffaceable mark. The plate is now gently moved about sidewise in the solution without letting its top project above it; after a few moments it is left undisturbed. The plate-holder is now got ready; the developer poured out into a suitable glass or measure for developing; the fingers rinsed in water and dried; and then the plate lifted by the dipper and examined. If the bath solution runs off from the plate in a greasy manner, the plate is again lowered and churned about for a moment until its surface, when lifted, is perfectly smooth. It is then taken off the dipper, held for an instant to drain, and set into the holder.

It is now ready for exposure in the camera, after which it is developed. No time must be lost, and every preparation for ex-

posure and development must be made before removing the plate from the bath. It will do no harm to leave the plate in the bath for even half an hour, while posing the subject or making other preparations, but it is better to remove it in, say four to six minutes.

On opening the plate-holder in the dark-room after returning from the camera, the upper edge of the plate is seen to be beginning to dry, while the lower corners are yet quite wet, and stand in two puddles of silver solution which have accumulated during the time of absence from the dark-room. The plate is carefully lifted out by the upper edge and rested for a moment on a clean piece of blotting paper, which absorbs the excess of solution at the bottom. If these drops were not removed, there would be marks made when the developer was applied.

The operation of developing a wet collodion plate is by no means as easy as that for the dry plate, and requires skill and neatness. The developer being handy in a convenient vessel, the plate is held in the left hand in the same position as when the collodion is applied, and the developer gently flooded over the film in an even sweep. It must flow quite freely, and cover the film to all four corners at once. If the plate has been kept long out of the bath in hot weather, so that the film dries a little, it will be exceedingly difficult to force the developer all over the film at once. The slightest check in the flow makes a peculiar curved mark that cannot be removed. But ordinarily there is no trouble in covering the plate well, if the film is not dried and if the right amount of solution is used. I allow myself one ounce, by measure, for plates 8½x6½ inches, and rather less than two drachms for 4¼x3¼. It will never do to use large quantities of solution and swill the free silver off the film into the sink; nor on the other hand ought any risk to be taken of not covering the plate fully by using too little bulk of fluid. The image of the collodion picture being built up of metallic silver which is deposited by the developer from the free nitrate of silver on the plate, it is manifest that too much developer washed over the film would remove the free silver which is indispensable to the forming of the image.

The developer for wet collodion plates is a solution of sulphate of iron in water of about thirty grains to the ounce, with sufficient acetic acid No. 8 added to keep the shadows clear and to make it flow smoothly over the film, say one-and-one-half drachms to the ounce. In hot weather it need not be so strong. A good working formula is:

Sulphate of iron,	800 grains
Acetic acid No. 8,	6 ounces
Soft water,	26 ounces

These developers are most active when freshly made up.

The light over the sink where the development is conducted should be low down, so that the plate can be watched through the film as well as by its upper surface. The development of a well-timed collodion plate should be quite done in from forty to sixty seconds. The plate is gently rocked while developing, and the density increases very rapidly. When nothing more appears, and *before* the image becomes "burned up," as in dry plate development, the plate, without draining, is laid under the tap and thoroughly washed.

If, when examined, the image is too thin, more density may be thus given: After well washing drain and apply

A—Nitrate silver	20 grains.
Water	½ ounce.
B—Citric acid	30 grains.
Water	½ ounce.

Mix A and B together and filter. Use only enough to just creep over the film (say 1 drachm for 8½x6½; then re-apply the developer and note the changes in intensity which take place very quickly. Wash the plate and fix in a fifteen grain solution of cyanide of potassium. Finally wash the plate, set it up to dry, and varnish.

Cleanliness.—Every utensil should be cleaned immediately after use. If left in a dirty condition it becomes more difficult to clean, and takes labor and time usually when we least can spare it.

PHOTOGRAPHIC PRINTING.

BY XANTHUS SMITH.

TO those who have an intimate knowledge of photography, and a love for the art as presented to us in its higher attainments, no apology need be offered for our having a few words to say upon the subject of the manner in which the very important process of printing is conducted.

We are inclined to think that a large number of amateur photographers, and a good many professional also, do not devote near enough attention to the matter of making or securing good photographic prints.

The securing of a good negative generally occupies a large share of attention, and it is proper that it should be so, but when one sees the injustice that is done many fine negatives in the way in which prints are made from them, one cannot help regretting that with all the pains that is bestowed upon the first step, namely, the making of the negatives, the negative and the art are not considered worthy of the bestowal of the full meed of pains which the difficult art of photographic printing requires.

We have said difficult in reference to photographic printing, not because the production of a fine silver print necessitates any remarkable ability or even capacity in the manipulator, but because it seems to be difficult to fall in with many who are really capable of conforming with that painstaking nicety to the details which are required to produce the highest class of work.

Apart from the risks run, in encountering the varying qualities of the paper, etc., furnished by manufacturers of photographic materials, all that would seem to be required in the making of good prints is a painstaking thoroughness, which is not met with in every individual.

The majority of amateurs, it stands to reason, will not tax themselves with the work, following the pursuit, as is frequently the case, more as a mere sport than anything else, and certainly we know that while there is a great fascination connected with the developing of a plate, the real sport of photography lies in

the search for subjects and the firing at them; and so many of the professionals are dependent solely upon their employees for the fulfilment of the printing, and knowing how rare it is for subordinates to carry out with with conscientious nicety the directions of their employers, it is really no wonder after all that such shortcomings are noticeable in the photographic prints which daily come under our observation.

It is true that many amateurs have neither the time nor proper conveniences for producing good prints, and of course such must be content with the best which they can get done for them by the trade.

We would simply draw the attention of such as have the means of doing their own printing to the importance of devoting sufficient pains to the art to produce really perfect prints. The requirements would seem to be principally to secure the very best of paper, to have the silvering bath in perfect order, and, in addition to care about the principal details of fuming, printing, washing, toning and fixing, and subsequent or final washings, to be scrupulously particular about all the trifling precautions, such as the avoidance of dirt, of air bubbles, the proper dryness of the paper at the various stages, the use of pads in the printing frames, and extreme cleanliness of the trays and even of the fingers throughout all the stages.

It is a fact not always at once recognized that the finest prints are often made from what are called thin negatives.

Such negatives as those which result from under-exposure, wherein the lights are very dense and the shadows clear or nearly clear glass, are not the ones that require such care and skill in the printing to produce fair prints. A negative of this description will make a brilliant print with any mode of printing, whether it be silver, platinum, or even blue print. When we come, however, to deal with those negatives that are filled with delicate gradations of half tone, those delicate supporting shades for the high lights and corresponding supporting tones for the deepest shadows, the printing must be of the most brillia nt kind that can be secured Poverty in albumen, in silver, in gold, over-toning, over-soaking, all must be avoided, or we have poor, weak, flat, poverty-stricken

prints, instead of those rich and at the same time refined, delicate pictures that look as though they had been breathed into existence by some fairy stroke.

Those who have the opportunity of inspecting the beautiful work exhibited in the show cases at the entrances to the leading photographic galleries in the large cities may realize the capabilities of the art of photography in its perfection, and they will perceive how much is due in a fine photographic work of art to refinements in the printing processes. I speak here especially of the capabilities of the art, because it must not be supposed that all the work resulting from the daily routine of these places is equal to that which is displayed in the show cases. It would be too much to expect that it should be so. Even with the most favorable conditions of skilled and careful employees, and the constant supervision of an able head, the art is not so certain in its results as to accord an even tenor of success, but the best results cannot be looked upon by any one practicing the art from a love of excellence as other than a source of the highest emulation.

In connection with this subject, one cannot help frequently recurring to the thought that it is very remarkable that photographic printing should have been so nearly at a stand-still since it jumped into existence more than thirty years ago. Paper coated with albumen, sensitized with nitrate of silver and toned with gold forms a unique process, which is remarkable because the materials are so peculiarly adapted to each other, and the whole to the end to be attained, that, with all its faults and uncertainties, no means seems to be attainable that will rival the albumen printing for the mass of photographic work.

When we think of the immense advance that was made in photography by the invention and perfection of the bromo-gelatine dry plate, and the efforts that are being made with the aid of advanced scientific knowledge to discover a means that will give us, in a simple manner, absolutely permanent prints, equaling in every way the beautiful negatives which are now so easily made, does it not seem strange that we are still plodding in the old rutty road of albumen printing?

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PHILADELPHIA HARBOR.

SHOWING THE ISLANDS NOW BEING REMOVED BY THE UNITED STATES.

MAJOR C. W. RAYMOND, CORPS OF ENGINEERS U. S. NAVY IN CHARGE.

NEGATIVE AND PHOTO-ENGRAVING BY
FREDK. GUTEKUNST, 712 ARCH ST., PHILAD'A.

NEGATIVE ON TRANSPARENT FILM.
ENGRAVED EXPRESSLY FOR AMER. JOUR. OF PHOTO.

Those who are pushing the merits of the platinum and bromide processes, and the in-coming gelatine and collodion papers, will say, "Have we not found it?" But, alas, it has not been found.

Under the most favorable conditions, it must be admitted, that very beautiful prints can be made by the platinum process, but who would not much rather have an indifferent silver print than a poor platinum print, and as to the bromide process, while it fills admirably a certain place, it cannot at all take the place of the albumen process.

When the matter of permanence is given the larger share of consideration the photo-reproduction processes seem to give rise to the hope that the most is to be looked for in that direction, but the care and expense connected with the most highly perfected modes put them beyond universal use.

PHOTOGRAPHY IN NATURAL COLORS.

[WITH surprising regularity we are called upon month after month to chronicle the solution of the color process. These interesting accounts almost in every instance find their way into the secular press. The designing individual pours the account of his discovery into the willing ear of some news-gatherer connected with one of the great dailies. The reporter, who knows nothing whatever about photography, writes up a sensational article, accepting the vagaries of his informant as an accepted fact, and thus the *news* is scattered broadcast over the world.

This time it is Dr. Vogel of Berlin who ignores all and everybody with cool indifference, and claims everything for himself. Dr. Vogel by this time has without doubt seen the accounts of the practical results in color photography as publicly shown by Frederick E. Ives of Philadelphia, and who is now on his way to England to demonstrate the process practically before the Royal Institute of Great Britain. If Dr. Vogel or his son had arrived at any practical results in this line, none would be more ready to show results than the aforesaid two Vogels, without waiting for the summer to come.

However, as Vogel's explanation is published after the Ives demonstration reached Germany, we may perhaps see some of Vogel's results after Ives has shown the world how to do it in his exhibitions in London. As we stated last month, the individual who discovers any progress in this line will show results first, the same as Mr. Ives is doing. The description of how it is done is an after consideration.

Every intelligent reader of any photographic periodical will at once recognize the fallacy of this new manifesto of the Vogels *pere et fils.*—ED.]

PROFESSOR VOGEL CLAIMS TO HAVE REPRODUCED THE NATURAL TINTS OF OBJECTS.

If Professor Vogel, the distinguished Berlin chemist, is not mistaken in the conclusions to which his experiments have led him, another one of the great scientific problems of the age would seem in a fair way to solution.

Professor Vogel, whose past career should be a warrant for his earnestness, assures me that he has now perfected a process by which it will be possible for skilled operators to reproduce the natural colors of animate and inanimate objects by photography.

The scientist who claims to have invented the process which is to accomplish this marvel is a man well on towards the sixties, of middle height, broad-shouldered, bearded, and bespectacled. He has paid several visits to America, and has been in frequent communication for years past with Professor Rowland, of Baltimore, and the other American scientific lights.

It was originally his intention to accept a post which has been offered him at the Chicago World's Fair. But his health is poor, and his son will probably go over in his stead.

At Professor Vogel's invitation I called at the workshop in which with his partner, Mr. Ulrich, he has lately been tentatively applying his process to lithography.

I asked the Professor whether he was convinced that he could photograph people in natural colors as perfectly as he could reproduce pictures.

He assured me repeatedly and in the most positive manner, both in speech and—at my request—in writing, that he could.

"I have not yet practically demonstrated the fact," said he, "because it is only lately that I have perfected my process, and the

light in Berlin has not been favorable to my experiments. I shall test my invention early in the coming summer, when the light is more brilliant. To do so now would be impossible, and for this reason—we need three plates of each subject, instead of the usual one. Subjects must sit three times without moving, and satisfactory plates could only be obtained in the summer."

"Can you give me some idea of your process?" said I.

"Well, partly," said the professor, "but I must preface my explanations by reminding you that, so long ago as 1865, Cros and Ducos du Hauron Frères, of Paris, tried to reproduce natural colors by photography. To this end they took three negatives through three glass screens—one blue, one red or orange, and one yellow—which they copied on three collotype plates. These three plates were then printed in color on the same piece of paper, the tones of color chosen being always those which had not acted upon the negative, just as ordinary black photographs are printed from plates on which black has not acted.

"In 1873 I introduced certain improvements in the process, with which Ducos du Hauron and Albert, of Munich, made further experiments. But the colors reproduced were unnatural, as the proper complementary tones were not employed in printing.

"On thinking over the matter I perceived that these true complementary colors could only be obtained by spectroscopy. I evolved the principle that the printing dye should be the same as that used for making the plates sensitive."

I hear that the Russian government has offered Professor Vogel 300,000 marks for the patent of his invention.

He has so far declined to take out patents, though, as yet, he objects to describing certain details of his process.

The memorandum in writing furnished by Professor Vogel to our Berlin correspondent and mentioned above is translated almost literally as follows :—

Photography in natural colors (as invented by Professor Dr. H. W. Vogel) was first suggested in 1865, when Cros and Ducos du Hauron Frères, in Paris, undertook to fix by photographic process natural colors, using three negatives for every picture, taken with a red, a yellow, and a blue glass. The three negatives so obtained were copied on collotype plates, and from these pictures were struck off by the use of printing inks, representing the complementary color to the color of the glass through which the negative had been taken. To print from the green glass collotype plates, red printing ink had to be used; to

print from a blue glass collotype plate, yellow dye was necessary. In short, to print from any of these collotype plates a dye was to be used of a color which had not acted on the corresponding negative plate, in strict analogy with common photography, by which a picture is printed in black from a negative on which black has not acted. This principle could not be successfully employed until 1873, when it was my good fortune to invent orthochromatic plates, that is, plates sensitive for red and yellow, the plates (by using a coating of bromide of silver) having been already made sensitive for blue. Ducos du Hauron, in Paris, and Albert, in Munich, first experimented with these plates.

But the colored pictures they reproduced seemed unnatural because they didn't understand the real complementary dyes. They took what seemed to be the best.

As I began to think over the matter I recognized soon that only by the spectroscope would it be possible to find out the real complementary color, and I published as early as 1885 the principle, *i. e.*, the printing dye, the same as the dye used by me for making the plates red or orange-sensitive, yellow or yellowish-green sensitive, etc.

It must be kept in mind that all the color-sensitive plates I made I prepared by the addition of certain dyes to the bromide of silver plates. For example, the blue cyanide makes the plate sensitive for orange or orange-red, and therefore the collotype plate prepared after such plate must be printed by cyanide or some other dye spectroscopically similar to cyanite.

In the same way the plate sensitized by eosine for yellow-green delivers the red collotype plates, which must be printed by eosine, etc. The plate sensitive for blue is printed by a yellow dye mentioned and published by me already in 1885 in my book. Mr. Ulrich, a chromo-lithographer, had proven first that this principle is right.

My son has improved the process by selecting the right dyes for coloring the plates, the right color-screens and the right printing dyes exactly corresponding with the matter for dyeing the plates to make them sensitive to the selected colored rays.

Experiments with oil and other paintings of the best masters—as Menzel, Knaus, Graeb, etc.—have proven that it is possible to reproduce the real colored pictures in the right colors.

We can in eight days do the work which, as done after the ordinary old chromo process by twenty polychromic stones, now takes about two months! And we are requested by the great art establishments of Germany permission to make the first use of the process.

We employed it at first for art and art-industrial reproductions instead of ordinary chromo-lithography. But we are beginning to reproduce landscapes and portraits in the summer season when light is improving.

The reason is that we want three plates instead of one for each persons, and these can only be had a short time in the summer. Every person must sit three times without moving. That is difficult.

Several other investigators may have tried to get simllar results after the old process of Ducos du Hauron. But I have seen nothing similar to ours in truth, because all have ignored the spectroscopical principle above mentioned.—*New York Herald.*

HOW PAPER IS SIZED.

THE gelatine used for sizing the better classes of writing papers is precisely the same as that so well known to culinary art, remarks Mr. Arnot in his dissertation on the paper-making industry as commonly carried on in Great Britain. It is the soluble portion of hides, bones, horns, and hoofs, and is extracted from these substances by warm, but not boiling, water in copper steam-jacketed vessels. The raw material most largely used by the paper maker for the preparation of animal size is what is known as "scrows," which are the pieces trimmed off the hides previous to tanning. These parings may be used fresh, but usually the source of supply is distant from the mills where they are consumed, and this renders it necessary to cure them so that putrefaction may be prevented.

The curing is effected by means of lime, and before the "scrows" are treated for the extraction of gelatine the adhering particles must be removed and the material itself softened by steeping in cold water. When the "scrows" are quite free from lime, and indeed restored very much to their original condition, they are put into the copper vessels and dissolved. From five to seven per cent. only of the original weight remains in the form of slime when all the gelatine has been removed.

To effect the complete removal of the gelatine, two or three successive solutions have to be made, and these are run together

into tanks or vats, through strainers designed to keep back slimy and other impurities, which would impair the brightness or otherwise injure the character of the size.

The temperature at which "scrows" should be treated so as to get the gelatine in its purest condition, varies according to the character of the "scrows" themselves, some varieties requiring a higher temperature than others. It may be taken as a general rule, that the finer the material is, the lower the temperature that will suffice, and the product will be purer. Inferior "scrows" are more difficult to dissolve, requiring a higher temperature, and besides, they do not yield such a pure size. About 140° Fahr. should be sufficient for the finer sorts, and from that up to 180° for inferior qualities.

A very small percentage of gelatine dissolved in water will, on cooling, become solid, but a comparatively short exposure to atmospheric influences, especially in warm weather, will cause it to putrefy and become liquid. To prevent this occurring on the large scale, alum is added to the gelatine shortly after it has been discharged from the dissolving vessels. The immediate effect of the alum is to thicken the size; but the element of acidity is also introduced, as the alum has naturally an acid reaction, and this is no doubt prejudicial to the paper treated. To neutralize this acidity, as well as to improve the size, or facilitate its application to the paper, some paper-makers add white soap to their gelatine. The writer fails to see what good this does, further than neutralizing the acid alum, and indeed this neutralizing of the alum means more than is generally supposed, for the result of the admixture of the two substances involves the destruction of both.

The soda of the soap combines with the sulphuric acid of the sulphate of alumina, forming sulphate of soda, and precipitating the alumina. Of course, the oily or fatty matters which were combined with the soda to form soap are set free, and may have some beneficial, though undefined, effect. It becomes a question of some interest, then, how the gelatine is really preserved from putrefaction, when soap is added in sufficient quantity to precipitate the whole of the alumina. It is quite clear that in that case the alum as such no longer exists, and it may be taken as estab-

lished that neither the sulphate of potash originally associated with the sulphate of alumina in the alum, nor the sulphate of soda formed by the reaction, have any preservative influence. The question just comes to be—does the precipitated alumina or the liberated oils accomplish this object, or is there really no chemical preservative agent present at all? Of course, it is quite likely that the soap may not be added in proportion equivalent to the alum, and that some sulphate of alumina may be left to exercise a wholesome influence.

The size, on being required for use, is reduced with water and conveyed to the sizing tub, the intermediate arrangements being such as will insure the tub being kept uniformly full. On the tub, or trough, the length of which is co-equal with the width of the drying machine, there is a roller which takes the web of paper down through the size, so as to saturate it thoroughly. The surplus adhering size is removed from the paper by passing it between a pair of rollers, placed so that the excess will flow back into the tub.—*The Paper Mill.*

Neatness.—Be careful of your dress, manners and speech,—a civil, polite manner always finds an easier existence than an uncouth or slovenly manner.—*Arno Kerster.*

World's Fair Notes.—In the California building will be shown a growing specimen of every California domestic flower obtainable, and also paintings, in water and oil, of 600 wild flowers and grasses.

The American Bible Society will make an exhibit in which will appear copies of Bibles in more than 200 different languages.

A New Use for Photography.—The U. S. Government in their efforts to suppress the so-called land boomers in Oklahoma resorted to a novel expedient. They furnished twenty-five United States Marshals with kodaks. Their orders were to press the button on every person found inside the lines. The result is that hundreds of boomers will be confronted with their photographs when they appear at the land office. This mode of identification may result in sending men to the penitentiary for perjury.

PRIVATELY ILLUSTRATED BOOKS.

TO many book collectors, and to the large and multifarious groups of readers who gather small and miscellaneous lots of books into so-called libraries, it will doubtless prove a surprise and a revelation to learn that, among the various forms of devotion to books, there exists that of the private illustrator—that there is a class of the bibliomaniacs who buy books for the express purpose of "inlaying" them with pictures, hunting out every possible pictorial hint or possibility that they contain, and enriching them with prints and etchings of great beauty and rarity. This mysterious and fascinating field of book worship has received lately at the hands of Mr. Daniel M. Treadwell very painstaking and elaborate study. Mr. Treadwell, himself a devotee and proficient in this elegant pastime, has prepared and published a monograph on this subject, wherein he recounts the marvelous exploits of rich and cultivated collectors, and offers a meed of unaffected praise to those who, less rich but equally enthsuiastic, have created masterpieces of the illustrator's art.

The aim involved in this accomplishment is to insert in some work, lending itself naturally to illustration, appropriate prints "which do not belong to the book, but which are pertinent to the subject treated." For instance, Mr. Treadwell's first venture was in Giraud's "Birds of Long Island," a book of some standing, and which naturally suggested a wide range of picturesque illustration. Mr. Treadwell does not, however, recall this early experiment with any sense of satisfaction, as it led him, in his search for material, to destroy a handsome quarto volume of the "Natural History of New York." One of his later and greater efforts was the illustration of Dr. Stiles's "History of the City of Brooklyn." In this interesting and suggestive effort he has added to the original work about two thousand three hundred pages, embracing portraits and prints of old historical landmarks, together with maps, manuscript additions, water colors, and letters. Of course, any amount of research and costly and lavish enrichment may be expended upon a book. The work itself may be

very suggestive, and if the illustrator is fastidious, he will hunt out the most striking, beautiful, and rare forms of illustration. For instance, Mr. Daly, the distinguished dramatic author and manager, has illustrated Macklin's Bible with thousands of illustrations, many of them originals, extending the book to thirty volumes folio. Nothing could be more superb. The work when finished is often inclosed in the most sumptuous bindings, which, with the cost of simply "inlaying" the illustrations, forms itself a respectable outlay. Take again the "Biographies of the Signers of the Declaration of Independence," by John Sanderson. This book, illustrated by Dr. Thomas A. Emmet, was extended to twenty thick volumes folio. It contains over three thousand autographs, eighteen hundred portraits, hundreds of prints and drawings, and fourteen water colors of American scenery by English artists who accompanied the British troops to America. These last were purchased at the sale of the Marquis of Hastings at $50 each. Here are signatures and letters of the signers, rare manuscripts and innumerable embellishments on India paper. This wonderful compilation is said to have cost twenty thousand dollars. The library of illustrated books owned by Mr. Hamilton Cole, of St. Mark's Place, New York, is another example of delicate taste and cultivated judgment. He has Izaak Walton, of 1836, enlarged to seven volumes, by the addition of two thousand prints, water colors, drawings, and many etchings. He has the "Memoirs of the Count de Saint Simon" in twenty volumes, royal octavo, "in faultless condition, with seven hundred portraits, nearly all proofs, including the one hundred and eighty portraits, proofs before letters, intended for the book, bound by Chambolle Dunn, in polished levant, with inside borders and watered silk linings." But perhaps the most gigantic and amazing example of this generous and refined industry is Mr. Stauffer's illustration of Westcott's "History of Philadelphia." Mr. Stauffer has added 8,000 illustrations, and expanded a book of some 2,500 pages to fifty volumes. Mr. Treadwell's estimate of the outlay and present worth of this extraordinary effort is $80,000, an estimate which, we believe, the distinguished illustrator considers altogether too high. Mr. J. H. V. Arnold, of this city, has extended Ireland's

"Records of the New York Stage" to twenty volumes folio, by the unrivaled addition of five thousand five hundred illustrations, and has expended over $9,000 upon his yet unfinished labors. It would be impossible in a short space to review the exquisite results of this form of bibliolatry, and the large work of Mr. Treadwell's is itself a fitting tribute to the zeal and enterprise of American illustrators. Few of our general readers and collectors are aware of the glorious and luxurious gems of the illustrator's art to be found in the private libraries of this metropolis, and Mr. Treadwell's monograph will perhaps stimulate and widen this pleasant form of literary diversion.

One word as to "inlaying," itself a delicate and skilled phase in the illustrator's craft, may be added. The master artists in this art, according to Mr. Treadwell, are Messrs. Trent, Toedteberg, and Lawrence, of Brooklyn. The process of "inlaying" is as follows: First comes the selection of paper of the proper quality and the size to which the book is to be extended. This done, the text of the book is all inlaid, page after page being inserted in the openings made in the paper sheets chosen. Then follow the prints. As these are of various sizes and shapes, they are cut down neatly, removing all extraneous margin, and have their outer edges beveled, the bevel extending about one-quarter of aninch upon the margin of the print. An opening is then cut into the sheet, of the size and shape of the print, making an allowance for a quarter of an inch lap on the inside, which is also beveled to conform with the print. The edges of the print and of the opening into which it is to be received are fastened together with rice flour paste. The sheets are then placed under a gentle pressure until required to be bound together in their proper order in separate volumes. In many cases, where print occur on the back of a woodcut, etc., which must be removed, the paper holding the engraving, etc., and the printed matter on its back, is split, by pasting the sheet between two pieces of stuff, which, when separated, removes on one side the printed matter, on the other the woodcut.

The artistic resources of the illustrator are drawn upon in this art, his historical knowledge and his technical appreciation of the excellence of engravings, woodcuts, etchings, and photographs. —*L. P. G., in the Scientific American.*

WHAT PAPER IS MADE OF NOW-A-DAYS—WOOD PULP vs. RAGS.

THE controversy over the use of wood fibre instead of rags is still raging fiercely in the English paper trade journals, and the defenders of wood fibre are becoming more and more numerous. The latest champion of wood fibre to enter the arena is Mr. W. Friedlander, who writes to the *Paper Trade Review* as follows:

"A man who to-day wants to fight against the introduction of cellulose, such as sulphite and soda, into almost all classes of paper can, in my opinion, only be put on the same level with that Spanish grandee who fought against the windmills. I appeal to the judgment and experience of those paper makers who use the best and chemically pure cellulose, which does not contain any undissolved particles or incrustations, and they will confirm that the fibre of such cellulose is in every way as pure as that of rags. An ever-increasing number of paper makers are using sulphite pulps. They are most careful in the selection of the kind they employ in their mills, and want an always regular and even quality guaranteed. They have reduced the consumption of rags very considerably, and yet have maintained the high quality o their papers.

It is stated that not two cellulose makes are alike. This is pretty well correct, but can our friend make any different statement about rags? Are the linens of one merchant exactly the same as the linens of another? All the more reason, therefore, to be careful in one's statements, and simply say, don't use bad sulphites for good papers. We all judge by results, and the sale of those qualities of cellulose which can be relied upon in their regularity is such that the largest paper mills on the Continent and in America have made installations of enormous magnitude to use more and more sulphite, and to produce with this material the finest paper for home consumption and export. I will even go further; fine sulphite pulps are used for the manufacture of all kinds of writing papers, including the very finest letter-post

papers, and also for the manufacture of the best lithographic and copper printing papers, ledger and account books.

"The pure fibre of cellulose, cotton or linen, is almost identical, with only this difference, that the paper makers are obliged to take the fibre of rags as it is, whilst the fibre of cellulose can be prepared as required, strong or soft. If some paper makers in the course of last year have had bad experience in the use of sulphite they have simply not yet learned which quality to adopt for their paper, and nobody can expect, if he wants to produce fine, durable paper, that he can do so with any rubbish. If buyers will only look at price and not test quality they must blame themselves if they earn loss instead of profit. With the admixture of good cellulose, soda or sulphite, as good a paper can be made any day as with the admixture of rags.

"The question whether we shall return to the use of rags is very soon answered. A paper mill, with good water and cheap coals, and which only uses cellulose, can make very much larger profits than a mill which uses rags; competition by the latter is out of the question, as the sulphite mill has the enormous advantage of working with a material which is always ready for use, saving time and labor, and in comparison with the rag mill increasing without extra expense the out-turn, doing away with all the preliminary waste and work bestowed on rags, smaller capital invested, etc., and the same applies to those mills that use wood pulp as an admixture with other materials. Not only shall we not return to the use of rags, but the consumption of them will get smaller and smaller in proportion to that of cellulose. Those few mills which still swear by rags to-day will in time be obliged to use cellulose, and the longer they wait the greater will be their disadvantage later on, as others will in the meantime have gained those experiences which they will lack."—*Wood Pulp News.*

The Hiawatha Camera Club of Minneapolis gave an exhibition last month in the library building, to which their friends were invited. The feature of the evening was an essay on astronomical photography, by Professor Wilson, of Northfield, Minn., followed by an exhibition of pictures by members of the club.

CRESCO-FYLMA.*

MR. HILL pointed out the advantages and applications of the method, and gave the following practical particulars:—

The principle of the process is to enlarge the film of any negative or positive by stripping. The particulars of working are as follows. Having added one part of water to three parts of the solution, the plate is placed on an ebonite tray (ebonite, however, not being an absolute necessity), and the diluted solution poured upon it.

In a few minutes the film will leave the glass, but without any appreciable expansion. When quite detached, it is necessary to leave it in the solution for a minute or two.

It is then lifted, supported on the glass it has just left, and transferred to a dish of clean water in which has been placed the larger glass it is intended to support the large film.

In this clean water the film will rapidly and evenly expand, and in about twenty minutes, during which time it will require no attention whatever, will have attained the limits of its enlargement. It is then ready to lift out of the bath, and placed upon a level support to dry.

It is necessary at this stage to blow out any air bells that may have accumulated under the film.

This completes the process, excepting that when it is dry washing is required, as in the case of an ordinary negative.

Should the plate to be enlarged be of such a size as not to be easily lifted out of the water bath after enlargement, an easy process is that of drawing off the water by aid of a small syphon, and allowing the film to settle down on the glass or opal.

The lecturer then proceeded to enlarge several positives and negatives, first treating a pyro-ammonia negative, enlarging some from half-plate to whole.

After that hydroquinone negatives and transparencies were enlarged from half to whole plate size, the transparencies being transferred to paper, glass, or opal.

Some questions were asked, and a hearty vote of thanks for the very successful demonstration was accorded to Mr. Hill.—*The Journal of the Camera Club.*

* (Demonstration of this method of enlarging, given by Mr. Albert Hill, on March 28th, before the London Camera Club.)

THE PENNSYLVANIA CHAUTAUQUA.

AT a popular gathering held at Mt. Gretna Park, July 31st, 1891, it was moved, seconded and decided by vote of the assemblage, that a committee, including the chairman, should be appointed to consider the advisability and prospects of organizing and establishing a "Chautauqua" at Mt. Gretna. This committee, consisting of Rev. A. M. Viven, of Cornwall, chairman; Tallie Morgan, Scranton; J. K. Bomberger, Bismarck; William G. Borgner, Lebanon; Frank Boyer, S. W. Turner and Rev. S. C. Swallow, D. D., of Harrisburg; Miss Florence Webster, Christiana; and James Brosius, of Octoraro, reported the same day in favor of the proposed project, and strongly urged immediate action toward its realization. A provisional committee of five was appointed from the number present, who should select a committee on organization, of fifteen representative persons from various parts of the State. This provisional committee, consisting of L. L. Grumbine, chairman, Rev. S. C. Swallow, D. D., J. G. Zook, Tallie Morgan and R. B. Gordon, met at Harrisburg, on August 26th, 1891, and selected as the original committee on permanent organization the following fifteen persons, namely: Rev. T. S. Wilcox, Harrisburg; Rev. S. C. Swallow, D. D., Harrisburg; Rev. J. Max Hark, D. D., Lancaster; Rev. H. B. Dohner, Lancaster; Rev. Joel Swartz, D. D., Gettysburg; Rev. Theodore E. Schmauk, Lebanon; Lee L. Grumbine, Esq., Lebanon; Rev. G. D. Woodring, Reading; Rev. Rufus Miller, Reading; S. W. Murray, Milton; Rev. H. H. Weber, York; H. T. Ames, Esq., Williamsport; Tallie Morgan, Scranton; Lewis D. Vail, Esq., Philadelphia; W. S. Essig, Royersford.

Some of the persons declining to serve, the committee was, from time to time, modified by the withdrawal of their names and the addition of new ones.

The first meeting of the General Committee on Organization met at Mt. Gretna Park, on September 24th, 1891. The persons in atttendance were Rev. J. Max Hark, D. D., Rev. H. B. Dohner, Rev. J. D. Woodring, Rev. T. S. Wilcox, Rev. Joel Swartz, D. D., Rev. Theo. E. Schmauk, L. L. Grumbine, R. B. Gordon, Rev. W. H. Lewars, J. H. Redsecker, C. Shenk and A. D. Hoffer.

After organizing by the election of L. L. Grumbine, chairman, and R. B. Gordon, secretary, the general committee divided itself into two sub-committees to devise and report plans of organization and finance.

The report of these sub-committees, after undergoing the various modifications which subsequent discussions suggested, and a fuller consideration showed to be wise and necessary, resulted finally in the "Constitution of the Pennsylvania Chautauqua," which was adopted at the first meeting of the stockholders, held in Lebanon, on January 6th, 1892.

At different meetings of the general committee Revs. Robert E. Carter, of Lebanon; George B. Stewart, of Harrisburg; Charles L. Fry, of Lancaster; G. W. Enders, D. D., of York; George Sigler, of Harrisburg; J. M. Carvell, of Middletown, and Charles L. Cooder, of Pottstown, were nominated and elected members of that body.

By this time the project had aroused much interest and gained great strength throughout the eastern part of the State. Various public meetings were held, at which the object and scope of the movement were explained and outlined. The leading educational men of the State evinced their cordial sympathy with it, and lent their co-operation to its successful development and consummation. It reeceived the endorsement of His Excellency, Robert E. Pattison, Governor of Pennsylvania, and many others occupying high stations in public life. Particularly fortunate was it in enlisting the prompt and hearty interest of the teachers of the public schools, while the influence of the press, as a matter of course, was freely and promptly thrown in in its favor.

Local committees were engaged in the sale of stock, and on January 6th, 1892, the stockholders met in Lebanon for organization, at which time the labors of the general committee were ended and its existence ceased. Rev. W. H. Dauber was elected chairman, and George W. Hayes secretary of the meeting. The stockholders elected the following persons to constitute the first Board of Managers: Robert B. Gordon, Joseph L. Lemberger, L. L. Grumbine, Jacob H. Redsecker, Harry B. Cochran, Charles L. Fry, George B. Stewart, S. C. Swallow, M. L. Montgomery, J. G. Mohn, John B. McPherson, H. W. McKnight, E. O. Lyte, W. H. Ulrich and W. H. Lewars.

The same day the Board of Managers elected the following officers: Chancellor, J. Max Hark, D. D.; President, Rev. George B. Stewart; Vice-Presidents, Dr. E. O. Lyte, and Dr. E. J. James; Secretary, Rev. H. A. Gerdsen; Recording Secretary, R. B. Gordon; Treasurer, George D. Rise; Executive Committee, Rev. Thomas S. Wilcox, Rev. T. E. Schmauk, Rev. J. M. Carvell, D. D., Rev. W. H. Dunbar, W. H. Egle, M. D.

Christian Culture, of Lancaster, Pa., was made the official organ of the Association.

Millionths of a Second.—Among other experiments performed by Prof. C. F. Boys, F. R. S., at the London Institute, and recorded in the early volumes of the Royal Society's proceedings, was the measuring the flight of the bullet, which was done as follows:

"The bullet in its flight was made to cut two wires, one at the muzzle of the barrel and the other six feet distant. These were attached to electro-magnets in connection with the main apparatus, which, roughly speaking, consisted of a carriage running on wheels and worked by a powerful spring. The pistol went off, and immediately afterward Prof. Boys triumphantly displayed, by means of the familiar lantern and screen, a smoked glass on which the apparatus had recorded its work. The points at which the wire had been broken were marked by a breakage in the two straight lines traced by the electro-magnets, and the distance between these two breaks represented the time which the bullet had taken to travel the six feet. The question arose how that period was to be discovered. But besides the two magnets a tuning fork was also attached to the carriage, and this tuning fork, when agitated, vibrated 1,000 times a second. The vibrations were recorded by a zigzag line on the glass, and just eight of the zigzags represented this distance marked by the magnets. This showed that the bullet traveled the six feet in 8-10ths of a second, or 750 feet in a second."

But even this fraction of time, small as it might seem, was very large compared with those to be dealt with in optical and electrical science?

"What must be done, for instance, to measure the millionth part of a second? The Professor did this by means of what was known as the revolving mirror, which was capable of being driven at the rate of 800 times a second. An electrical spark of the twenty-five millionth part of a second's duration had been measured by this means. But the sparks he was using were longer than that, and could be used for photographing. He had some photographs of a soap bubble taken by Lord Rayleigh, in which it could be seen precisely what the bubble was doing when it burst. This was not so extraordinary after all, for it only burst at about thirty miles an hour, or forty-five feet a second. But he had some more wonderful photographs of a bullet traveling at 2,000 feet a second."—*Jeweler's Review.*

Love Order.—Put every article after use at once in its proper place, so that you can find it when wanted without having to look for it.

YEARNING OF A MISFIT.

BY HERBERT L. BAKER.

NEXT time the writer is hatched he will come out an artist. That is, if he has anything to say about it.

Not a tonsorial artist; he has no overweening desire to chase a sharp edge up and down within tantalizing distance of the jugular. Not a whitewash artist; his youthful trifling with the backyard fence destroys all germs of that desire. Nor yet a song-and-dance artist; the public would not stand his wearing his voice too decollete, and early practice before his father's hitching strap is too significantly brought to mind at any mention of dancing.

Last time he came into the world a misfit, artistically speaking. The soulful yearnings of an artistic genius, the clumsy fingers of a wild man of Borneo, and the steady hand of a palsy victim,—do not seem to combine into excellence of execution.

Strange, isn't it?

Somehow he cannot take a piece of paper, scratch around over it a little with a borrowed pencil, and enrapture every beholder with the result. Neither can he fill a squirt-gun with soiled water, and blow a lovely landscape on the canvas. Nor take a red-hot poker with a pine board, and imitate the alleged beautiful pyrographs so enthusiastically described by the devotees of the latest fad, nor yet dip a brush in a pale black moisture and dash off studies in wash drawing.

As a boy, he knew a cow pretty well when he saw it, and has distressingly vivid recollections of old brindle's horns; but after drawing an especially vigorous and lifelike picture of her cowship on a slate, his admiring friends rather overdid matters when they turned the slate wrong side up and went into superfluous ecstasies over it as a drawing of a ship scudding under bare poles.

True, he took the regular course in drawing, which at that time began at drawing the baby-cart, followed by lessons on drawing water, drawing the long bow, and drawing his wages

(which he could do with commendable regularity), stopping just short of drawing a prize in the l—tt—r—s he trifled with. But these lessons do not seem to have fitted him for a drawer of drawings, a sketcher of sketchings, a designer of designings. His circles will insist on having several flat sides, with occasional erratic humps more original than beautiful. His straight lines show a wobbling need of a temperance pledge, or a divorce from the contaminating influence of the wicked rail fence.

These longings for ability to create beautiful forms arise from no Quixotic notion of adding to the sum of human pleasure. No such unselfishness. But he has observed that the men who can promptly and satisfactorily turn their pencils to any subject are scarce, and therefore high-priced. And he is alive to the substantial gratification of being high-priced himself. Not that there is a scarcity of artists, so-called by themselves. Plenty of them can take a fine-tooth pen and sling off the prettiest and most impossible birds and scrolls you ever saw "executed by Mr. Blink after one lesson at Blunk's Commercial College."

Plenty of them can spoil lots of good material beating nature at her own game, and paint landscapes in colors never dreamt of by that sadly inartistic old dame. Plenty of them can sketch out agreeable designs, for the trade journals and otherwise, very pretty to look at and free from any suspicion of utility. Plenty of them can "letter" in that careless rough-and-ready style, supposedly artistic, which does not require that the reader decipher more than half of it without taking a day off to study out the fearful and wonderful disguises which A B C can assume in such hands.

But the artist who has eyes and ideas of his own, or who can take the misty suspicion of the shadow of an idea from a customer's mind, and work out what he wants when he does not know himself, who can make his work useful, available, as well as beautiful, who can draw a handsome plain letter, and two alike in the same line; who, in short, can turn his pencil satisfactorily to any practical subject, and illustrate it in an appropriate and attractive manner, and who can sketch "taking" designs for all sorts of uses,—this man has a fortune in his fingers, if he will

work hard, keep up with the times, and attend strictly to business.

He will need to understand the limitations of the printer, what he can and cannot do; be familiar with all the different processes of engraving; know which process will produce the best results for each subject, and how to prepare the drawings for each process; understand combinations of colors, and know how to get the most shades out of the fewest paintings; make drawings for color plates which will unerringly register; and especially to make bold, attractive, easily-read lettering. Such a man is the connecting link between the merely beautiful and merely practical?

There now! That is what the writer yearns to be next time he cracks eternity's shell and again appears in the nest of time.

When he looks upon his efforts to be artistic, and finds them to vary between the merely ugly and the appalling horrible, is it any wonder he longs to hurry his karma into the hence, with the hope of "better luck next time"?

Ah! that "next time" his yearnings may be ever so soulful, his longings ever so deep, but, after all, it is better to be a misfit than not to be; and he will try to be content to let others chase the elusive phantom of beauty, while he devotes his energies to salting down the big round cart-wheels which alone make beauty profitable.—*American Art Prtnter.*

Blue Transparencies.—Beautiful blue transparencies may be produced, according to M. Rossel, in the following simple way: Commercial cyanotype paper is exposed beneath the negative until the image will be very intensely visible, when it is thoroughly washed and placed for fifteen minutes in a ten per cent. solution of bichromate of potash. After the print has again been well washed, it is allowed to dry, and then rendered transparent by placing it on a warm glass plate and treating it carefully with paraffine. The print is then framed between two glass plates. The above-mentioned cyanotype paper, giving white lines on a blue ground, may be prepared by placing plain photographic paper in a solution of 24 grammes of ammonio-citrate of iron and of 25 grammes of potassium ferricyanide in 150 c.c. of water, and then drying it in the dark.

The Editorial Dropshutter.

Early Daguerreotype Days.—The especial attention of our readers is called to the series of papers under above title, commencing with the present number. The papers will prove of additional interest as in some circles the daguerreotype of old is again being taken up to see whether there are any possibilities of the process which may have escaped the early investigators, or which are now made possible by our far greater knowledge of the action of light and chemicals. It is expected that the papers will be fully illustrated by reproductions of the earliest specimens of the art, the pictures having been placed at the disposal of the writer by their various owners and custodians. Another curious feature of the search for specimens, which has extended over months, is the fact that most all of the old daguerreotypes are still in a good condition, as our reproductions of the first studio pictures, made early in 1840, plainly show. At first it was thought that all daguerreotypes were merely ephemeral, but time has certainly proven the contrary. Then again some specimens show a stereoscopic effect far superior to our present efforts. Here is a question for our scientific clubs: Why should these early daguerreotype efforts, made with crude apparatus and such chemicals as could then be procured, be more permanent than the processes of the present day, with all our increased knowledge and facilities, chemical, optical, and mechanical?

"The Wet Collodion Process," III., by Ellerslie Wallace. A careful perusal of these papers will repay any young professional photographer whose sole knowledge of the art consists of experience with the commercial dry-plate process. The information here imparted is practical, while the formulas have all been proved in actual practice. No learner or apprentice should neglect to read, study, and preserve this series of instructive papers. To all such we would say, preserve your JOURNALS and have them bound at the end of the year.

What Paper is Made of.—Last month we published a leader upon the permanency of photographic productions, mechanical as well as heliographic, showing that the trouble without doubt was with the paper used. This month we follow with a paper from the *Wood Pulp News*, a paper published in the interests of the paper trade. A careful perusal must furnish plenty of food for reflection to the intelligent reader, be he a toiler with the pen or a manipulator of the camera.

Privately illustrated books, a paper which originally appeared in the *Scientific American*, and appeals directly to the amateur who at the same time is a lover of books and art. It is just here that the new photographic processes, such as bromides and platinums, together with silver prints on plain paper, come into play; a fact of which the reviewer as well as the writer of the treatise mentioned seems to be ignorant.

It often happens that an illustration cannot be duplicated, yet two or more copies are needed. Thus the photographic processes come into requisition and supply the deficiency. We have seen many such examples, where photographic copies were used, and where proper care was taken to have the whites clear the results were always satisfactory.

We have in Philadelphia and in some interior towns of Pennsylvania illustrators and inlayers second to none in the country, who pride themselves that the inlaying is so well done that it cannot be detected except by an expert, prominent among whom are Ferdinand J. Dreer, Esq., of Philadelphia, and the Rev. Dr. Dubbs, of Franklin and Marshall College, of Lancaster.

Nor should it be overlooked that the Mr. Stauffer, quoted in the main paper is a native of Lancaster County in Pennsylvania, and that he started his now priceless collection while living at his home in Pennsylvania's inland metropolis.

There are several persons in Philadelphia who "inlay" professionally, and whose work is second to none. A few illustrators, however, still send their inserts to Europe to be mounted, where the supplying of photographic copies for the purpose has assumed quite large proportions, a fact which should not be overlooked here.

Photographic Work.—A new candidate for public favor has appeared under above title. The new periodical is a weekly, and is published by Piper & Carter, 5 Furnival Street, London, E. C. The subtitle sets forth that it is to be "a concise and complete record of all phases of photographic activity." We welcome this new star in the firmanent of the photographic constellation, and predict an extensive orbit for the new luminary.

Photographic Work is published by the former publishers of the *Photographic News*, and in make-up and style, editorially and mechanical, is the counterpart of the *News* of old. The new venture has the full advantage of over a quarter of a century of experience, and will be welcomed by all the old patrons of the *News*.

OUR ILLUSTRATIONS.

Our Frontispiece.—A specimen of aristotype work on the *Omega* sensitized paper; negatives are from the celebrated Sarony Gallery in New York. The omega is a chloro-bromide emulsion paper, and has by merit alone established a firm footing for itself with both professionals and amateurs. The prints were made by the C. E. Hopkins Company.

A Panoramic view of the harbor of Philadelphia, with the islands now being removed by the United States Government. A reduced reproduction in half-tone of a panoramic negative.

This view was taken by Mr. Fredk. Gutekunst, of 712 Arch Street, Philadelphia, with a Moessard Cylindrographe Photographique, fitted with a new French lens, made expressly for panoramic exposures, upon a curved film 36 inches long. The camera is fitted with a peculiar automatic attachment which obviates the necessity of uncapping and capping the lens, as it opens and shuts the lens the moment the exposure is started and concluded: this insures extreme sharpness over a field of 180°. It will be further noticed that the view is entirely free from the curvature of the lines, so common to views of this kind. Silver prints as well as phototypes of full size have been made of this negative.

Our illustration, engraved expressly for the AMERICAN JOURNAL OF PHOTOGRAPHY, is from a half-tone-block, made in the Gutekunst establishment, a department of photo-engraving having lately been added to the already extensive reproduction plant. The technique in every department does credit to the establishment, and compares favorably with any of the older houses.

Do not forget to study and practice the old wet collodion process.

Photography has made the work of the lecturer far more interesting to his audiences than used to be the case.

Paper Stock.—The difference,—while clean white No. 1 rags are quoted at $5.50 per cwt., wood pulp is rated at $1.25.

Photographic Hints and Formulæ.

According to the *Photographische Correspondenz*, the following mixture forms an excellent medium for writing upon glass:

I.—Fluoride of sodium	36 grams.
Potassic sulphate	7 grams.
Water	500 ccm.
II.—Chloride of tin	14 grams.
Dissolved in water	500 ccm.
Then add muriatic acid	63 ccm.

For use, equal parts of I. and II. It is applied with a quill pen same as ordinary writing ink. After a lapse of half an hour the writing will be etched matt upon the glass.

Process for Stiffening Films:

Carbonate of soda	2 grams.
Borax	5 grams.
Water	1600 ccm.

When dissolved add:

Pulverized shellac	32 grams.

This mixture is then boiled over a low fire until the shellac is completely dissolved, then add:

Glycerine	2 grams.
Water to bring volume to	3200 ccm.

After a few days the solution is to be filtered, as a sediment is apt to form.

Films, after being thoroughly fixed and washed, are dipped while still wet in this mixture, until they are thoroughly saturated. The films are then tacked up to dry in the usual manner. If properly done they need no varnishing, and will stand as much handling as glass.—*Wochenblatt.*

Combined Day and Flash Light.—Eugene Hakh, of Stuttgart, lately read a paper upon his method of life-size heads, in which he gave a description of his peculiar process, which consists in supplementing the day light with artificial illumination, which is said to combine rapidity with softness of the negative. The lecturer stated that he uses a special camera and objective, the latter made expressly for him

by Dr. Steinheil, and requires diaphgrams with square openings both in front and behind the lens.

To obtain the maximum of illumination large reflectors are employed to concentrate the sunlight, in addition to large cartridges of Blitz-pulver which give an immense light with extra rapid combustion.

Dr. Steinheil states that in an ordinary studio the special lens would require an exposure of at least eight minutes to produce a full-timed plate.—*Photographische Correspondenz.*

Varnish for Coated Paper.—Beyersdorff gives following formula as best for coated papers such as our half-tones are printed on, and is used on the continent for collotypes:

Borax	100 grams.
Water	300 grams.
Pulverized white shellac	200 grams.
Alcohal	100 grams.

Dissolve borax in water, and bring it to a boil; then add shellac with constant stirring until thoroughly dissolved, then remove from fire and continue stirring until half cold; then add the alcohol under constant stirring. If the varnish is too stiff, dilute with equal parts water and alcohol.—*Dr. Eder's Yearbook 1892.*

Auro-Platino Toning Bath.—Dampen the silver prints, then place in gold bath:

Water	2880 parts.
Borax	45 parts.
Chloride of gold	1 part.

Let them remain until they have turned to a warm brown tone, then wash in clear water one minute, after which place in platinum bath:

Water	2880 parts.
Citric acid	30 parts.
Chloroplatinite of potassium	12 parts.
Common salt	48 parts.

Until they turn to a purple black tone.—*E. Valenta, Dr. Eder's Yearbook, 1892.*

To Photograph on Silk.—Immerse the silk in

Water	1 ounce.
Gelatine	5 grains.
Chloride of sodium	5 grains.

Hang it up to dry, then float it for half a minute on a fifty-grain solution of nitrate of silver; dry, print, tone, and fix as usual.—M. A. R.

Water-Color Medium.—This serviceable medium so indispensable to the retoucher and photo-colorist is prepared as follows: Procure from a butcher half a pint of ox gall. Place this in a clean saucepan, and add an ounce of powdered alum and an ounce of common salt; place over the fire, and when it boils remove for half an hour to cool; then boil up again, and repeat this boiling and cooling three or four times. After this allow it to settle for four hours, and decant off into a bottle, in which put two or three drops of essence of lemon.—M. A. R.

The following is a method of obtaining an intense negative by means of one much too weak to print from: Place the negative in the copying camera, in the conjugate of which a transparent positive is obtained, which can be intensified by means of bichloride of mercury, followed by a cyanide and silver solution, to any degree of density.

The transparent positive in turn is placed in the copying camera, from which in the same manner a negative can be obtained of any amount of density required.—R.

COLOR PHOTOGRAPHY.

WHILE some of the American newspapers are discussing, as something new, the admittedly imperfect experiments of foreigners, it is interesting to note what the *Pall Mall Gazette* says of the work of a Philadelphia inventor:

"An entirely novel means of gaining by photographic processes an approach to the natural color appearances of scenes and objects is shortly to be brought to the notice of the British public. The invention, which is called "Heliochromy," is the discovery of Mr. Frederick E. Ives, of Philadelphia. It has received considerable attention in the United States, and it will no doubt be a matter of discussion in metropolitan scientific circles for some time to come. Mr. Ives is to give a demonstration at the conversazione of the Royal Society this evening, and he is engaged to lecture at the Royal Institution on the afternoons of the 10th and 17th of the present month. He is going after that to Scotland with Mr. Cameron Swan (who takes great interest in the discovery) to photograph landscapes for purposes of color demonstration, and he will by and by proceed to Switzerland for a like purpose. A representative of the *Pall Mall Gazette*, who was afforded an early opportunity of inspecting the results obtained, sends the following account:

"To clear the ground a few matters may be premised. The invention in the sense of pure science does not claim to be color photography. In the strict meaning, a color photograph would be a picture taken directly by lens and camera with the colors and the light of nature. Such a thing has never been done, and there is nothing in the present state of science to justify the supposition that this result may ever be accomplished. It certainly has been possible to obtain upon a film of quicksilver some impression more or less fleeting of a few of the colors of the spectrum. It would, morever, be practicable, with prolonged exposure, to obtain some kind of colored image from a powerfully illuminated object of, say, a red color. But the impression would be a mere silhouette of color without light and shade of gradation. Such successful experiments have frequently been made and chronicled from time to time in the newspaper press as the early promises of a great discovery. The last occasion may be fresh in the memory of many. This was the result of some researches by Professor Lippman, of Paris. But his discovery admittedly fails to render even the simplest combinations of color. It would appear that no clue exists to the secret of color photography. The dream may fascinate, and the hope may stimulate, but the search has hitherto been as fruitless as for the philosopher's stone. This much for the scientific. To the more practical we may state that there is little chance of having one's portrait done in the colors of life. It requires two minutes' exposure in Mr. Ives's camera to take a view in open sunlight, so that none could sit still during the more extended exposures necessary in portraiture. Neither has the discoverer yet arrived at entirely satisfactory results on paper or on solid substance. He has made good transparencies on glass, but his greatest successes are projected from a kind of magic lantern, and in a small instrument of the 'stereoscope' kind, which he calls the 'heliochromoscope.

"If Mr. Ives has not discovered the secret of color photography he has made a nearer approach to the colors of nature than anything previously accomplished. The principle, based on the composite character of light, may best be grasped by describing the procedure. A photographic camera is fitted with an ingenious arrangement of mirrors, which throw three images, in trefoil arrangement, from the single lens upon a sensitive photographic plate. Each of these images is 'filtered' through a color screen before reaching the plate. These screens correspond with the three primary colors, or, as Mr. Ives prefers to call them, the three fundamental color sensations. By this means one of the images receives the red-colored rays of light, one the

blue and one the green. The result is three transparent, colorless photographs of the object, differing each from the other in what we may here call light and shade. The transparency so obtained is placed in a triple magic lantern, the tubes of which are fitted with colored glasses. These glasses of primary colors have required much study, as affecting in their precise view the truthfulness of the result, and it says much for their accuracy that they combine together on the screen as white or colorless light. The lantern tubes are so arranged that when the three images are projected by limelight on a screen they are exactly superimposed. The result then is this, that the combined images fall upon the screen in the colors of nature, or in a very tolerable approach to them. Mr. Ives has several photographs of flowers, such as geraniums, and views in the Yellowstone National Park, which he projected for the information of our representative, who can testify to their undoubted brilliance. They will be shown at the Royal Society this evening.

"The apparatus which Mr. Ives has invented will thus be seen to be a kind of magic lantern suitable for lectures and demonstrations. He has also made his 'heliochromoscope,' a little box like a stereoscope, which shows flowers and views in natural colors. It will be manufactured shortly, and should command success as a delightful drawing-room toy. The whole invention will, doubtless, give in a few years a great impetus in a new direction to amateur photography. For, if it is interesting to take views in monochrome, how much more so will it be when the amateur can see his pictures in color!

"The matter of colored prints is much more difficult than that of transparencies, because the purest of pigments combine indifferently as compared with light. But Mr. Ives hopes to have good results at no far distant date."

Maxims for Amateurs.—Never bite off more than you can chew.

Never interfere with anyone whose livelihood depends upon photography.

Remember it is the negative, not the toning bath, that is the important factor in the tone of the print.

The best way to doctor a negative is to make a new one.

Don't attempt to make your own dry plates.

The latest substitute for glass is a kind of dry, flexible collodion. It resists the action of salts, alkalies and dilute acid, and is inodorous and transparent. Its chief use is likely to be in photography.

THE PHOTOGRAPHIC SOCIETY OF PHILADELPHIA.

A STATED meeting of the Society was held Wednesday evening, May 1st, the President, Mr. Joseph H. Burroughs, in the chair.

The Board of Directors reported the election of several active members.

After the reading of the Minutes and the conclusion of the regular routine business, Julius F. Sachse, Esq., read a paper upon "The Chronological Portraiture of General George Washington." In connection with this subject the lecturer exhibited a series of thirty-six portraits of the illustrious subject in platinum, black and sepia, arranged in chronological order, and including every known authentic portrait from life, from Peale's first study at Mt. Vernon in 1772 to that of St. Memin in Philadelphia in 1798, the last ever made from life.

Included in the collection were photographic copies of the mask taken of Washington's face by the celebrated artist, Hondon. Hondon came to this country for the purpose of modeling a statue of Washington, which was to be placed in the Capitol of Virginia, pursuant to a resolution of the General Assembly in June, 1784.

He spent two weeks at Mount Vernon in making sketches and careful measurements of Washington's person, and on October 13th of that year he made, in plaster, a mask of the face, from which a cast was made and the well-hnown bust modelled.

The original life mask remained at Mount Vernon, and upon the occasion of the removal of the General's body to the present sarcophagus in 1832, it was loaded to Struthers, the Philadelphia marble mason, who made a plaster cast from the mask.

This was presented to the Historical Society of Pennsylvania, and from the cast Mr. Sachse made the three photographic studies which give a clearer conception of the true lineaments of the illustrious original than any other portrait in existance.

The portraits were arranged against the wall in such a manner that the changes wrought by the cares of state and increasing age could be clearly traced, the whole offering an opportunity for a comparative study of Washington portraiture never before presented.

Upon the conclusion of the address it was resolved, upon motion of Mr. Hudson S. Chapman, that a vote of thanks be extended to Mr. J. F. Sachse for his interesting and valuable paper read before the Society this evening.

Mr. A. E. Maris exhibited a Hetherington magazine hand camera, and explained the mechanism and practical manipulation.

Mr. John Carbutt followed with a "Genie" hand camera. A number of specimen prints made by this camera were also shown.

A collection of lantern slides, made by members of the Waterbury Photographic Society, were to have been shown, as announced, at this meeting, but as they failed to materialize, a number of excellent Mexican view by Mr. Wm. H. Rau were substituted.

Adjourned.

Be courteous.—There's money in it. It costs nothing and pays well. One can be "rushed," be independent if he wishes, and yet be courteous. According to the *Canadian Druggist*, in these days of keen competition every little counts, and the storekeeper who is anxious to keep up and increase the number of his customers must never forget to treat them with the utmost courtesy. Some people, otherwise pleasant, put on a very disagreeable nature when they go shopping, making the life of the person who serves them as miserable as possible. But this must be borne with, and politeness served out with the goods just as readily as paper is given without charge for each parcel. "Oh, how disagreeable they are at Mr. So and so's." "Yes, their goods are cheap, but I'd sooner pay Mr. Some-one-else more and be treated civilly!" Expressions like these are very frequently heard, especially in the largest centres, where there is considerable unknown or "catch" trade.

Speaking of one of the largest stores in Toronto the other day to a lady, she told us that having once been treated rudely there she would never enter the door again. Of course the fault lay with a single clerk, and we cannot commend her in her sweeping judgment of the whole establishment, but unreasonable as it may seem, the majority of ladies (and ladies do most of the shopping) will be influenced in this way. Keep the right goods, of the best quality, charge enough for them, wrap them up neatly, sell them for cash, and never lose an opportunity of being polite to a customer, and your trade will constantly become larger and more profitable.

WANTED.—A skillful dentist to fill the teeth of a gale.
WANTED.—A cook to prepare dinner on a mountain range.
WANTED.—A stand-up collar for the neck of the woods.
WANTED.—A hat to fit the head of the Missouri River.
WANTED.—A set of artificial teeth for the mouth of the Mississippi.

In the Twilight Hour.

NEVER complain of being ill used.

UNQUIET meals make ill digestions.

DON'T be afraid of a little fun at home.

BE slow to contract a new and doubtful alliance.

THE best capital to begin life on is a capital wife.

THINK twice before you break off an old and tried friendship.

TRY to let everybody's faults be forgotten, as you would wish yours to be.

A MAN'S good breeding is the best security against another's bad manners.

UNBECOMING forwardness oftener proceeds from ignorance than impudence.

THE three things most difficult are,—to keep a secret, to forget an injury, and to make good use of leisure.

NEVER speak boastingly of your business: keep your own counsel about the management of your affairs.

FIND recreation in looking after your business, and your business will not be neglected in looking after recreation.

GRIEF knits two hearts in closer bonds than happiness ever can; and common sufferings are far stronger links than common joys.

REFLECT on what you see and hear. Set your mind at work; reason with candor; weigh well and consider for yourself, decide and act.

CONSIDER the causes of the good standing of some, and the decline and fall and want of success of others, and regulate your conduct accordingly.

BE cautious with whom you associate, and never give your company or your confidence to persons of whose good principles you are not certain.

THE more a man follows nature and is obedient to her laws, the longer he will live; the farther he deviates from these, the shorter will be his existence.

BEWARE of desperate steps; the darkest day,
Live till to-morrow, will have passed away.
—*Cowper.*

MANY a man lives a burden to the earth; but a good book is the precious life-blood of a Master-spirit, embalmed and treasured up on purpose to a life beyond life.—*Milton.*

AN ingenious French writer observes that those who depend upon the merits of their ancestors may be said to search in the root of the tree for those fruits which the branches ought to produce.

BY relying on our own resources we acquire mental strength; but when we lean on others for support, we are like an invalid who, having accustomed himself to a crutch, finds it different to walk without one.

THE greatest efforts of intellect have almost always been made while the passions are in their greatest vigor, and before hope loses its hold on the heart and is the elastic spring which animates all our thoughts.—*Hazlitt.*

CHEERFULNESS. — A cheerful temper joined with innocence will make beauty attractive, knowledge delightful, and wit good natured. It will lighten sickness, poverty and affliction, and render deformity itself agreeable.

Literary and Business Notes.

OUR enterprising occidental contemporary, the *Californian*, in the May number publishes an interesting illustrated paper on "Opium and its Votaries," showing the effect of this Chinese vice upon the miserable wretches who have become addicted to the drug. The paper is fully illustrated, and shows the terrible squalor of these haunts of iniquity which have lately been introduced into all large cities to a greater or less degree. The *Californian* states:

For ten years photographers, amateurs and professional, have been trying to obtain photographs of the underground opium dens of San Francisco, but without success. The intruders were driven out, their lives threatened, cameras ruined, and it was generally understood that a man took his life in his hands in making such an attempt. The *Californian Magazine* proposed to illustrate the following paper in a manner never before attempted,—in fact, by photographs taken by flashlight in these dens, and on a certain night, a few weeks ago, accomplished its purpose by force of numbers, intimidation and diplomacy; the results are here with submitted, being the first interiors of these dens ever shown or likely to be.

Realizing the danger, and the possibility of getting a stray bullet in the rush that was sure to come, the Californian party was made up with a view to taking the pictures, come what might.

The party was led by one of the most skilled and determined detectives in San Francisco, Chris Cox. Others were Mr. H. J. Brener, then of the Art Department of the *Californian*, Frank Davey, the expert photographer of W. Taber's, and his assistant, Mr. Amsden, with another representative of the magazine. The camera was a large eight by ten instrument, while a flash box and a plentiful supply of *Blitzpulver* completed the outfit. In many cases the smokers rushed out or hid themselves before the shot could be taken, and in the dark dens, many feet below ground, amid yells, oaths, threats and shrieks, often left in complete darkness, the party accomplished its work, one of the pluckiest performances in the cause of "reform" ever made.

THE PRINCIPLES OF A PHOTOGRAPHIC LENS. R. and J. Beck, 48 Cornhill, London, E. C.

A pamphlet of twenty pages, intended as a guide to the use of a photographic lens by the amateur photographer. The work treats upon the principles of a photographic lens, the lens proper, the selection of a lens, together with the use of stops and the swing back. A readable and instructive pamphlet.

JAHRBUCH FÜR PHOTOGRAPHIE UND REPRODUCTIONSTECHNIK FOR 1892, by Dr. Josef Maria Eder. Published by Wilhelm Knapp, Halle a. S. Illustrated by 106 wood cuts in addition to 33 full-page reproductions representing every school of photo-reproduction.

This annual stands head and shoulders above all its European competitors. The matter contains 283 pages of original contributions for the work, divided into 89 different papers representing 68 different writers.

The second part recites the progress made in photography and the reproduction-technic during the years 1890–1891. Among the illustrations are two studies from negatives by Mr. J. F. Sachse, editor of the AMERICAN JOURNAL OF PHOTOGRAPHY, showing the growth of plant life within seconds of time.

We commend the Jahrbuch to every photographer, professional or dilettante, who is familiar with the German language, and such as are not will find occasional extracts in this Journal. It is one of the most valuable additions to our photographic library for the year.

ANNOUNCEMENT.—Notice is given of the consolidation of the Eastman Company with the New Process Film Company under the name of the Eastman Kodak Company. All contracts and liabilities of the old company have been assumed by the new company.

WE are in receipt of No. 5 of "The Library of American Authors," — *The Heiress of Cameron Hall*,—with compliments of Vernon Bros. & Co., New York. The book is printed on bood paper free from all ground or sulphite wood pulp.

RECENT PATENTS.

THE following list of patents relating to the photographic interests is specially reported by Franklin H. Hough, solicitor of American and foreign patents, No. 925 F. Street, Washington, D. C.

ISSUE OF APRIL 5TH, 1892.

472,257—Photographic Camera; B. J. Edwards, assignor to Eastman Company, Rochester, N. Y.

472,021—Pictures, stretcher for the paper or canvas of; J. N. Anderson, Chicago, Ill.

ISSUE OF APRIL 12TH, 1892.

472,702—Photographic Plate-Changing Apparatus; F. A. Fichtner, Dresden, Germany.

472,883—Photographic Shutter; F. R. Hoyt, Watkins, N. Y.

ISSUE OF APRIL 19TH, 1892.

473,375—Photographic Apparatus, Coin-Operated; W. H. C. Bernitt, Hamburg, Germany.

473,358—Photographic Camera; F. Servus, Berlin, Germany.

473,188—Photographic Shutter; C. F. Green, Kalamazoo, Mich.

473,358—Photographic Shutter; F. Servius, Berlin, Germany.

ISSUE OF APRIL 26TH, 1892.

473,814—Photographic Dark Rooms, Candle Lamp for use in; H. A. Benham, W. H. Thomson, London, England.

473,767—Photography, Improving Oil Paintings by; L. Meyer, Berlin, Germany.

473,763—Photography, Making Relief Plates by; J. Husnik, Prague, Austria-Hungary.

ISSUE OF MAY 17TH, 1892.

474,570—Photographs of Hard Surfaces, Producing; A. Muller-Jacobs, assignor to Heliocaustic Art Co., N. Y. City.

474,833—Photographic Kit; J. H. Iden, Bourbon, Ill.

ISSUE OF MAY 24TH, 1892.

475,372—Photographic Pictures, Developing; M. Andresen, Berlin, Germany.

475,654—Photographic Shutter; J. R. Albrecht and E. Ortman, New York, N. Y.